

**REMARKS**

Claims 1 and 13-16 are pending in the present application. Claims 1, 13 and 14 are herein amended. No new matter has been entered. It is respectfully submitted that this Amendment is fully responsive to the Office Action dated April 13, 2006.

**Claim Rejections - 35 U.S.C. §103**

Claims 1 and 13 were rejected under 35 U.S.C. §103 as being unpatentable over *Kasai* (5,821,594) in view of *Wu* (6,180,988 B1). Applicants respectfully disagree with the Examiner's reasons for rejecting these claims. However, to expedite prosecution and clarify the subject matter of the present invention, Applicants hereby amend claims 1 and 13. Support is found, for example, in Figure 9 and the corresponding discussion in the specification. In view of these amendments and the following remarks, Applicants respectfully request that the Examiner withdraw the obviousness rejection of claims 1 and 13.

In rejecting these claims, the Examiner acknowledged that *Kasai* fails to disclose *said low permittivity region being made of a lower permittivity material as compared to said sidewall film*. However, the Examiner asserted that *Wu* discloses a semiconductor device comprising air gaps 22 and that *Wu* discloses the air gaps reduce the effect of gate fringe capacitance. Therefore, the Examiner concluded that it would have been obvious to have *said low permittivity region being made of a lower permittivity material as compared to said sidewall film* in order to reduce the effect of gate fringe capacitance.

However, the Examiner failed to produce a *prima facie* case of obviousness, for example, because “air” is not a lower permittivity “material” as described in the claims. Therefore, even if one were to combine the cited references in the manner suggested by the Examiner, the resultant combination would not be the present invention.

Also, the Examiner failed to produce a *prima facie* case of obviousness with regard to claim 13, for example, because the references are not properly modifiable since the proposed modification would destroy the function of the *Kasai* device. For example, the bottom silicon oxide layer 59 cannot be a cavity because the formation of the etch stop layer would fill in layer 59.

Claims 14-16 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Kasai* ‘594 in view of *Wu* ‘988 B1 as applied to claims 1, and 13 above, and further in view of *Lee* 6,251,737 B1. However, to expedite prosecution and clarify the subject matter of the present invention, Applicants hereby amend claim 14. Support is found, for example, in Figure 9 and the corresponding discussion in the specification. In view of this amendment and the following remarks, Applicants respectfully request that the Examiner withdraw the obviousness rejection of claims 14-16.

In rejecting these claims, the Examiner acknowledged that *Kasai* in view of *Wu* fails to disclose *a part of a side wall lower portion of said gate is removed to have said low permittivity region formed into a notched shape*. However, the Examiner concluded that, in view of *Lee*, it would have been obvious to have a part of a side wall lower portion of said gate is removed to have said low permittivity region formed into a notched shape in order to gate is removed to

have said low permittivity region formed into a notched shape in order to reduce signal transmission delay, and increase operating speed.

However, Applicants respectfully submit that *Lee* does not teach this limitation. For example, a part of a side wall lower portion of said gate is not removed, because it is never formed in the *Lee* reference. See Figs. 1A-1H.

Accordingly, Applicants respectfully traverse the Examiner's obviousness rejection of claims 14-16 for these reasons and also for the reasons stated above with respect to claims 1 and 13.

Furthermore, with regards to claims 1, 13 and 14, Applicants respectfully submit that the combination of references cited by the Examiner fails to teach or suggest *a low permittivity region locally provided at a lower portion of the side surface of said gate with the low permittivity region being covered by said sidewall film...wherein said low permittivity region (cavity) is less than 40 nm in height and width.* This amendment is supported by Fig. 9 and the related discussion in the specification. As the prior art cited fails to suggest or motivate the combination of the cited references, the claimed invention is not rendered obvious and claims 1 and 13-16 should be allowed.

For example, one objective of the present invention is to achieve a "minimum local low permittivity region". As stated in the specification, "the inventor has reached such an idea to form a required minimum local low permittivity region only at a portion being the most effective in reducing the fringe capacitance". Fig. 9 of the present invention, for example, shows the result of a computer simulation and the related discussion in the specification states that "locally forming a microcavity having only 5 nm in

height and 5 nm in width simply enables to reduce the fringe capacitance by 10% or more as compared to that of the conventional structure in which the cavity does not exist". See page 17. However, the cited references, either alone or in combination, fail to discuss a semiconductor device comprising a required minimum local low permittivity region as described in the claims.

For example, *Lee* discloses a sacrificial layer 106 used to form a cavity as having a thickness of about 500 angstroms to 800 angstroms, which has difference of 10 times or more with the size shown by Fig.9 of the present application as "5 nm is enough". Thus, it obvious that *Lee* fails to teach or suggest having a minimum local low permittivity region as discussed above.

Furthermore, *Kasai* does not discuss, teach or even suggest the effect of reducing the fringe capacitance, so Applicant's respectfully submit that any combination of *Kasai* with *Wu* and/or *Lee* can never reach the present application invention.

Accordingly, in view of the aforementioned amendments and accompanying remarks, Applicants respectfully request that the Examiner withdraw the aforementioned objections to claims 1 and 13-16. Furthermore, Applicants submit that the claims, as herein amended, are in condition for allowance and request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

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Amendment under 37 C.F.R. §1.116  
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If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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